

THE AIR LAND SEA BULLETIN



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Cover Photo—US Army Photo

Director Comments—Final Thoughts From the Director

The Air Land Sea Application (ALSA) Center located at Langley AFB, Virginia, continues to publish multi-Service tactics, techniques, and procedures (MTTP) to meet the "immediate needs of the warfighter. We currently have 15 active publications in various phases of development at this time, with 4 additional publication revisions scheduled to begin work later this year. One of these publications, *Tactical Employment of Unmanned Aircraft Systems (UAS)*, addresses a doctrinal void and defines MTTP for operational UAS considerations faced by our Services on a daily basis. Historically, UAS has been strictly an intelligence, surveillance, and reconnaissance platform. With the proliferation of multiple classes of unmanned aircraft (UA) and increasingly innovative and effective roles to use them, the UA has proven itself much more than an 'eye in the sky,' it has become an indispensable combat multiplier for the commander. That is why we have dedicated this issue of the *Air Land Sea Bulletin* to unmanned aircraft systems and the value they bring to the fight.



MQ-1 Predator armed with an AGM-114 Hellfire missile flies a training mission. [USAF Photo]

The ALSA staff continues to change. We have recently said farewell to LTC Lou Schurott and will lose two Air Force, our one Marine, and one additional Army action officer this summer as they complete their assignments here. Their replacements have big shoes to fill and I am confident that the mission at ALSA will continue to be executed by the best

and the brightest the Services have to offer.

This will be my last input to the "Air Land Sea Bulletin" as I retire after 28 years in the Army. I could not have chosen a better job or worked with a better community of professionals as I have here at ALSA. I can honestly say that being in a position to respond directly to the immediate needs of warfighters, in a timely manner, with the quality products produced here at ALSA, has been most rewarding. I would like to thank the ALSA Joint Action Steering Committee for their trust, support, and guidance during my tenure here. Some of the general officers will be leaving this summer and their support and guidance to ALSA has kept us relevant and focused. Also, those Service Joint Doctrine Directorates (JDDs) and the iron majors/lieutenant colonels deserve thanks and credit for doing the heavy lifting of publication production. Finally, my sincere thanks goes to my five government civilians who do an outstanding job keeping us all on track. Colonel Rob 'Snort' Givens will become the Director of ALSA in June and will undoubtedly continue to add to the great reputation of the Air Land Sea Application Center.

We continue to welcome suggestions for publication topics that fill tactical interoperability or doctrinal voids between the Services and special operations communities. Those that make it through the program approval process are normally produced in 12 months and become Service doctrine or reference publications for all Services. The overwhelming majority of our publications are less than 2 years old, validating our ability to produce current MTTP and get it to the field, training centers and school houses quickly. For more information on any of our MTTPs or to make a new publication recommendation, visit our Web site at <http://www.alsa.mil> or contact us at alsadirector@langley.af.mil

...the UA has proven itself much more than an 'eye in the sky,' it has become an indispensable combat multiplier for the commander.

A handwritten signature in black ink, appearing to read "M.R. Martinez".

MICHAEL R. MARTINEZ, Colonel, USA
Director

Joint Unmanned Aircraft Systems Center of Excellence (JUAS COE) Mission

By
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In June 2005, the Joint Requirements Oversight Council (JROC) directed the establishment of a Joint Unmanned Aircraft Vehicle Center of Excellence (JUAV COE) at Creech Air Force Base (AFB), Indian Springs, Nevada. On 8 September 2005, the JROC approved the JUAV COE mission statement, charter framework, and organizational framework as an operationally focused, jointly-manned organization. The organization, renamed the Joint Unmanned Aircraft Systems Center of Excellence (JUAS COE), achieved initial operational capability (IOC) in October 2005.

The Chairman of the Joint Chiefs of Staff signed the formal JUAS COE charter on 23 November 2005. The source of Service funding and personnel for the JUAS COE was further codified in program budget decision (PBD) 704 on 20 December 2005. The JUAS COE is commanded by a rotational O-7/flag or general officer. The organizational construct includes rotational O-6/colonel assignments for the deputy commander and two division chiefs (the Joint Doctrine and Training Division and the Joint UAS Battlelab Division), a GS-15 technical director, and a support staff. Each division will have four supporting O-5/lieutenant colonel branch chiefs. Final unit manning will consist of approximately 64 personnel (military, government service employees, and contractors). The current JUAS COE personnel strength is 15 personnel (primarily contractors), with military personnel programmed for assignment in fourth quarter, FY06.

The JUAS COE reports to the JROC through the Joint Staff Director for Force Structure, Resources, and Assessment Directorate (DJ8). The United States Air Force (USAF) serves as the executive agent for the JUAS COE and, in this role, provides administrative support and the coordination of common

functions for the unit.

The mission of the JUAS COE is to provide support to the joint operator and the military Services by facilitating the development and integration of common UAS operating standards, capabilities, concepts, technologies, doctrine, tactics, techniques, and procedures (TTP) and training. The JUAS COE will leverage existing Service initiatives and activities to provide joint, integrated solutions and improved interoperability. The following are the mission essential tasks for the JUAS COE:

- Develop organizational work-plan based on combatant command (command authority) [COCOM]/joint operator UAS requirements and priorities.
- Develop relationships and coordinate efforts with the Service UAS battlelabs and centers of excellence, and with the Intelligence community and interagency partners.
- Coordinate with the Joint Unmanned Aircraft Systems Materiel Review Board on current/future materiel solutions.
- Lead the development of joint UAS concepts of operations, TTP, and doctrine. Review UAS capability requirements submitted into the Joint Capabilities Integration Development System (JCIDS) and Joint Urgent Operational Needs (JUONs),
- Address UAS implications/impact in: integration into national, international, and theatre airspace; integration into joint command and control (JC2); and spectrum management.
- Develop and orchestrate experiments, exercises, and demonstrations to improve joint UAS operations.
- Support joint exercise and training activities that facilitate the improved integration of UAS capabilities into joint operations.

The JUAS COE has formed an O-6/colonel-level advisory council with the goal of meeting quarterly. This forum provides a mechanism to assist in the outreach to Services, combatant commands, and other agencies, and

The mission of the JUAS COE is to provide support to the joint operator and the military Services by facilitating the development and integration of common UAS operating standards, capabilities, concepts, technologies, doctrine, TTP, and training.

ultimately aides in the identification of UAS requirements and priorities that will form the foundation of a comprehensive JUAS COE action-plan. The JUAS COE conducted their inaugural advisory council meeting in November 2005 and identified the following UAS issues for action/resolution:

- Develop an overarching Joint Concept of Operations for UAS Employment.
- Address airspace integration issues to include: UAS flight in national (file and fly) and international airspace and UAS integration into combat operations (battlespace deconfliction).
- Address spectrum management challenges based on proliferation of UAS capabilities—allocation of bandwidth.
- Address UAS integration into the JC2 architecture.

The JROC has identified the JUAS COE to lead two very important efforts in FY06. First, the JUAS COE is the office of primary responsibility for seven US Joint Forces Command (USJFCOM)-sponsored DOTMLPF¹ change recommendations (DCRs). As such, the JUAS COE determined that the most important DCR tasking was to develop an overarching Joint Concept of Operations for UAS Employment. The additional DCRs for action are: (1) identify requirements for UAS expertise in a joint task force or component staff and recommend training for joint staff planners and commanders on UAS employment; (2) develop exercise scenarios and training objectives that integrate UAS into live-fly exercises; (3) improve UAS simulation programs; and (4) identify and assess materiel and non-materiel solutions that enable UAS to depict sensor pointing and position information in the common operational picture.

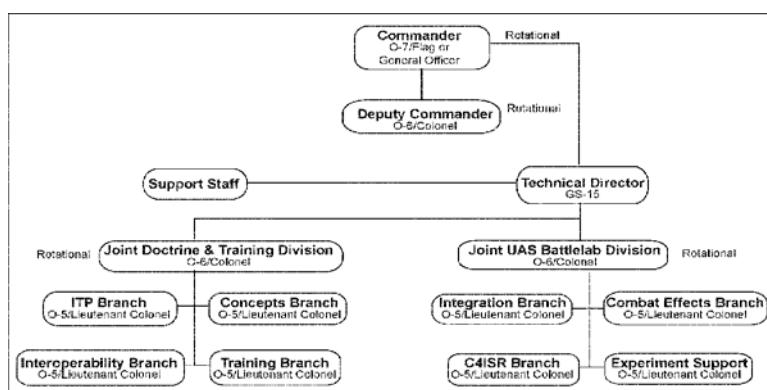
Second, the JROC identified the JUAS COE as the lead organization to conduct a UAS Requirements Study that would assess joint UAS intelligence surveillance and reconnaissance (ISR) and non-ISR

capability requirements. The study will assess the current and future force structure's ability to meet requirements, as stated by the combatant commands and relevant studies, in addition to assessing current UAS programs' abilities to fulfill capability gaps.

Additionally, the JUAS COE is participating—

- with the United States Marine Corps (USMC) in the analysis of alternatives for the USMC's vertical UAS capability requirements;
- with the USAF Doctrine Center's UAS terminology study;
- with the Air Land Sea Application Center to publish a Multi-Service Tactics, Techniques, and Procedures (MTTP) for Tactical Employment of UAS;
- and with the United States Army Training and Doctrine Command (TRADOC), the Joint Air Ground Operations Group, and Joint Close Air Support (JCAS) Executive Steering Committee (ESC) in the resolution of UAS JCAS-related doctrine and TTP issues and the update of TTPs and courseware.

As we build our campaign plan and foster relationships with other UAS-related organizations, the JUAS COE will continue to focus on effectively working joint issues and reducing duplication of efforts. The JUAS COE welcomes the opportunity to work collaboratively to address and resolve joint operator UAS operational capability requirements and challenges.



JUAS COE Organizational Chart

END NOTES

¹DOTMLPF stands for doctrine, organization, training, materiel, leadership and education, personnel and facilities.

US Air Force Predator UAVs Have Moved Into a More Overt Strike Role

By
Mr. Bill Sweetman
IDR Technology and Aerospace Editor
California

The US Air Force has removed the Northrop Grumman ZPQ-1 Tactical Endurance Synthetic Aperture Radar (TESAR) from its force of MQ-1L Predator unmanned aerial vehicles (UAVs), according to Lieutenant Colonel Ken Kilmurray, deputy chief for UAV requirements at Air Combat Command.

We have removed the radar and lost the capability to rebuild the capability," Col Kilmurray told a recent conference in London. Operators are no longer being trained to use the radar.

TESAR has received mixed reviews since its deployment in the Middle East.

The radar itself dates back to the mid-1990s and its display is apparently difficult to interpret.

- The decision to remove TESAR was taken to offset the loss of endurance due to the addition of Hellfire.
- TESAR has received mixed reviews since its deployment to the Middle East.
- Meanwhile, the new MQ-9B Predator B has been formally assigned to the attack role.

Meanwhile, all operational Predators have been upgraded to MQ-1L standard and are able to launch Hellfire missiles.

In part, the decision to remove TESAR was taken to offset the loss of endurance due to the addition of Hellfire; the aircraft loses an hour of endurance for every 9 kg of weight. For the same reason, the experimental carriage of Stinger air-to-air missiles on the MQ-1L has been abandoned.

Col Kilmurray acknowledges that the electro-optical/infra-red (EO/IR) sensor on the MQ-1L Predator is limited as a search tool because it loses resolution at wider fields of view. However, he said, in doctrinal terms "every Predator mission starts as intelligence, surveillance, and reconnaissance (ISR)."

The primary Predator missions still include ISR tasks such as preparation of the battlespace, reconnaissance along lines of communication, and the stake-out of high-value targets. However, the Predator is being increasingly used for close air support and other armed missions. In the 12 months up to October 2005, deployed Predators had taken a total of 32 Hellfire shots and had designated targets for eight other strikes.

In 15 cases, the operators of Predators over the battle area provided targeting information to other aircraft, resulting in their own use of weapons. Other emerging missions for the Predator include support for combat search and rescue and interdiction.

Meanwhile, the new MQ-9B Predator B has been formally assigned to the attack role. The US Air Force has defined the aircraft as a hunter-killer; the basic requirements for this include the ability to generate a targeting solution for its weapons—the laser-guided GBU-12 bomb, GBU-38 Joint Direct Attack Munition, and Hellfire, plus another air-to-ground weapon—and releasing them accurately.

The Predator B will carry a radar—General Atomics' APY-8 Lynx—with ground moving target indication and automatic target classification modes. A lightweight version of Lynx will also be fitted to the Army's Warrior UAV: a development of the Predator A.

Two YQM-9A test vehicles armed with GBU-12s are already operational in the attack role, and the first Predator B squadron—to be fielded at Creech Air Force Base in Nevada—will be designated as an attack squadron not a reconnaissance squadron as is the case with others.

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Predator Mission

Operation Iraqi Freedom—Maintenance workers perform last minute preflight checks on an RQ-1 Predator before a mission at a forward-deployed location. The DOD's UAS Roadmap provides a defense-wide vision for UA and related technology. (USAF Photo by SSgt Jeremy T. Lock)

By
LtCol Jonathan J. Greene, USAF
Creech AFB, NV

In the development of air power, one has to look ahead and not backward and figure out what is going to happen, not too much what has happened.

— Brigadier General William 'Billy' Mitchell

Introduction

With the addition of Hellfire air-to-ground missiles and advanced optical sensors, the MQ-1 Predator unmanned aircraft system (UAS) is routinely called upon to conduct close air support (CAS) operations in the skies over Iraq and Afghanistan. Its combat record over the past year underscores the Predator's value to the joint force with support for over 220 raids, 140 troops-in-contact (TIC) situations, 30 coordinated air strikes, and 25 Hellfire shots.¹ As the MQ-1's attack capability expands, the question arises as to whether a Predator crew is capable of providing terminal attack control for CAS missions when acting as a forward air controller (airborne) (FAC[A]).

This article contends that the MQ-1 system offers a limited capability to control CAS and advocates the development of applicable tactics, techniques, and procedures (TTP).

The discussion opens by examining some of the limitations commonly associated with the MQ-1 and describes their affect on the ability to control CAS in today's combat operations. Next, a description of the Predator's unique capabilities offers evidence that its operators can perform the essential tasks required of a FAC(A). The article concludes with implications for training and doctrine.

MQ-1 Limitations:

Significant Weaknesses or Overlooked Strengths?

Augmenting a manned FAC(A) platform with an unmanned MQ-1 is a contentious subject because the Predator lacks some strengths normally associated with modern-day FAC(A) aircraft: unlimited visibility, high speed, and good maneuverability.² Nevertheless, the next few paragraphs argue that the MQ-1's limitations do not completely hinder the ability to control CAS and may actually be advantageous in present-day combat operations.

Some argue that Predator pilots and sensor operators should not control CAS because of the MQ-1's restricted visibility. With a single-axis field of view (FOV), Predator crews cannot see both the target and the attacking aircraft and, therefore, cannot conduct type 1 terminal attack

...the question arises as to whether a Predator crew is capable of providing terminal attack control for CAS...

...the Predator's persistent presence enables its crews to support any sudden requests for CAS.

control.³ However, this apparent setback should not affect the ability to control most CAS in the current conflict because the majority of controls are either type 2 or type 3.⁴ Although there are a few cases where a joint terminal attack controller (JTAC) requires type 1 control (such as a strafe attack), most of the CAS attacks in Iraq and Afghanistan use precision weapons and occur either above 10,000 feet altitude, during nighttime operations, or in remote areas devoid of a qualified terminal attack controller. In those instances, JTACs usually cannot see both the target and the delivery aircraft. As a result, a JTAC often relies on forward observers or video relays for target verification—a task especially applicable for the Predator. In short, it should be possible for Predator operators to execute types 2 and 3 control given the nature of combat operations in Southwest Asia. Even if opponents accept the above argument, they still might argue that the Predator cannot survive in a high-threat environment.

Skeptics may disapprove of the MQ-1 as a FAC(A) platform because it is a slow, lightweight aircraft susceptible to enemy air defenses. Although these limitations could affect the MQ-1 during a major conventional war, there are several reasons why a small, propeller-driven aircraft is well suited as a FAC(A) in the current conflict rather than a fast, “threat safe” fighter. First, the threat to aircraft operating at medium altitudes over Iraq and Afghanistan is practically non-existent. Second, the Predator’s glider-like characteristics facilitate a constant loiter capability that is perfectly suited for counterinsurgency operations. In a war characterized by cat and mouse tactics, it is difficult to predict where and when the enemy will strike next. With its ability to stay overhead and monitor areas of known or suspected insurgent activity, the Predator can provide highly responsive support when friendly troops encounter sudden eruptions of insurgent violence.⁵ Third, the Predator’s turbo-charged engine is quiet compared to jet-powered aircraft. With its medium altitude standoff capability and low audible signature, insurgents and terrorists are often unaware of the Predator’s lurking presence. Whether supporting a planned raid, escorting a convoy, or responding to a TIC, the Predator’s persistent presence enables its crews to support any sudden requests for CAS. Despite these attributes, some still question whether MQ-1 operators can maintain situational awareness (SA)

over a target area simply because the aircraft is unmanned.

Three Essential Tasks: Situational Awareness, Targeting, and Communication

Effective CAS control requires a heightened awareness of friendly positions, accurate target identification, and effective communications.⁶ It is traditionally accepted that manned aircraft are necessary for directing CAS because of an on-scene FAC(A)’s ability to hawk the battlefield and mitigate the hazards associated with authorizing air attacks in close proximity to friendly ground forces. However, the ability to control CAS with a remotely piloted aircraft (RPA) is becoming more plausible due to the Predator’s data link architecture, optical sensors, and communications capabilities. Although the data input differs from traditional manned FAC(A) aircraft, the MQ-1 gives operators the ability to maintain SA, identify enemy targets, and provide responsive CAS—even when the crew is geographically separated from the area of operations.

A FAC(A) must have high SA in the vicinity of the target area to alleviate risk and manage CAS assets effectively. There are a couple of inherent MQ-1 capabilities that can increase a Predator crew’s battlespace awareness. First, the Predator’s extensive on-station time facilitates integration with supported ground units. Whereas FAC(A) fighter aircraft have a limited amount of playtime due to fuel constraints, the Predator can remain airborne in excess of 20 hours. The Predator’s continual overhead presence eliminates the need for frequent handoffs of FAC(A) responsibilities—a time-consuming procedure that results in a significant loss of SA every time a new FAC(A) arrives on station. Maintaining continuous contact with ground forces promotes seamless coordination, familiarity with the target area, and the ability to exploit fleeting opportunities.⁷ Second, the MQ-1 uses a networked infrastructure to help keep SA in the target area. Exchanging data between aircraft, ground units, and numerous command and control (C2) nodes, the Predator UAS can present real-time aircraft trajectories, friendly ground positions, and enemy locations onto graphics displays inside the ground

control station (GCS). Thus, even though not physically located above the battlefield, Predator pilots utilize digital information to gain SA analogous to that of an on-scene FAC(A)—especially if directing CAS at night or in low-visibility conditions. With target-area SA established, the Predator FAC can then find, fix, and track the enemy.

Fratricide during CAS operations is often the result of inaccurate or misidentified enemy locations.⁸ The MQ-1's optical and infrared sensors allow Predator crews to precisely find, identify, and mark enemy targets during day or night conditions. With a wider FOV and greater magnification than most aircraft targeting pods, the Predator can pick out and track hard-to-find targets in diverse terrain.⁹ However, finding the target is only part of the equation. Once located, Predator crews must be able to pass accurate target information to end-users.

Effective communication is another key factor when controlling CAS. There are several ways that the MQ-1 system can relay target information to aircraft, ground forces, or C2 agencies in order to provide responsive CAS. To begin with, the Predator can broadcast real-time video of the target to JTACs, CAS aircraft, or ground commanders equipped with a remote operations video enhanced receiver (ROVER) to allow verification of the target.¹⁰ Moreover, the MQ-1's infrared target marker and laser range designator can accurately mark targets, derive accurate non-mensurated coordinates, and steer laser-guided weapons. Just as a picture is worth a thousand words, these nonverbal targeting capabilities cut down the amount of voice communications required for target identification. Instead of a time-consuming target talk-on, the Predator can significantly speed up the time between target confirmation and weapons release by transmitting target video or providing a laser spot. Finally, the MQ-1's multi-band radio, satellite communications, and secure connectivity offer an interoperable data infrastructure between aircrews, ground units, C2 nodes, and intelligence organizations. These diverse communications capabilities allow Predator operators to process air support requests, prioritize CAS missions, integrate joint fires, and provide enhanced target tracking.¹¹

Conclusion

After reviewing its basic capabilities, the Predator can act as a FAC(A) platform when conducting types 2 and 3 CAS in a lower-intensity combat environment. Its persistent loiter capability, advanced sensors, and extensive communications architecture

enables operators to keep SA, identify enemy targets, and relay critical information. This, in turn, enables the Predator to respond quickly to air support requests and manage CAS assets. In addition to its airborne capabilities, the Predator UAS is easily maintained, has a small logistical footprint, and can operate in remote locations—all highly desired attributes in Iraq and Afghanistan. This does not mean to imply that the Predator should replace FAC(A) aircraft such as the A-10 or F-16. However, it does suggest that the Predator is well suited for CAS operations in a war characterized by insurgency and terrorism. That said, Predator crews must be trained properly to understand the intricacies of integrating with ground forces, orchestrating CAS aircraft, and the dangers of clearing aircraft to expend ordnance near friendly troops. To fully exploit the MQ-1 as a FAC(A) platform, pilots and sensor operators must attend formal FAC(A) training courses, develop unit upgrade programs, and update their TTP. As simple as that sounds, there are deeper implications.

The MQ-1's FAC(A) capabilities cannot be denied. But given the stringent qualification, training, and currency requirements for today's JTACs and FAC(A)s, some may balk at the notion of investing so much to produce a Predator FAC(A) that is limited to types 2 and 3 CAS.¹² Two options could alleviate that concern. The first option focuses on using Predator crews as joint forward observers (JFOs) and tactical air coordinators (TAC[A]s).¹³ Although Predator crews already coordinate strikes and work with JTACs, they could increase their proficiency and recognition within the joint community with formal joint training. A fully qualified Predator JFO or TAC(A) can become a significant force multiplier when working with JTACs to accomplish types 2 and 3 CAS (as a FAC[A] often does). A second option may be to redefine type 1 terminal attack control so that it eliminates the requirement to “visually acquire the attacking aircraft and the target for each attack.” In addition to its optic sensors, the advent of advanced low-latency data links such as Link 16 and Blue Force Tracker can provide MQ-1 crews digital information that gives the ability to analyze attack geometry while acquiring the attacking

...Predator crews must be trained properly to understand the intricacies of integrating with ground forces, orchestrating CAS aircraft, and the dangers of clearing aircraft

aircraft, friendly ground forces, and enemy targets at the same time. Changing the definition of CAS to reflect advances in the execution of modern warfare will enable a fully trained Predator crew's capacity to control all varieties of CAS. Regardless of whether the Predator is FAC(A) capable, joint warfighters need published TTP in order to understand how the MQ-1 is currently employed.

Since its development over a decade ago, the Predator system has become the most requested air asset by US Central Command for combat operations in Southwest Asia.¹⁴ Oddly enough however, there is hardly any mention of the Predator in joint doctrine for CAS or interdiction even though the Predator conducts CAS, performs joint interdiction, and coordinates air strikes on a routine basis. Although this article focused on the Predator UAS, other unmanned aircraft systems have similar issues pertaining to the development of updated and consistent TTP. The Air Land Sea Application Center's latest endeavor to develop multi-Service TTP for UAS is a step in the right direction for codifying procedures that can be used in the field today. Publishing proven tactics based on sound training and hard-won combat lessons will ensure that not only the MQ-1, but all UAS, have established guidelines to maximize their combat performance in support of joint operations.

END NOTES

¹LtCol John Breeden, "57 Operations Group Predator," introductory briefing for the Predator Basic Course, 11 RS, Creech AFB, NV, 17 January 2006.

²Bruce R. Pirnie et al., *Beyond Close Air Support: Forging a New Air-Ground Partnership* (Santa Monica: RAND, 2005), 117-19.

³Joint doctrine lists three types of terminal attack control. Type 1 control is used when the JTAC must visually acquire the attacking aircraft and the target for each attack. Analysis of attacking aircraft geometry is required to reduce the risk of the attack affecting friendly forces. Type 2 control is used when the JTAC requires control of individual attacks and any or all of the following conditions exist: a) JTAC is unable to visually acquire the attacking aircraft at weapons release, b) JTAC is unable to visually acquire the target, c) The attacking aircraft is unable to acquire the mark/target prior to weapons release. Type 3 control is used when the JTAC requires the ability to provide clearance for multiple attacks within a single engagement subject to specific attack restrictions (e.g., time, geographic boundaries, final attack heading, specific target set, etc.) and then grant a "blanket" weapons release clearance. Joint Publication 3-09.3 *JTTP for CAS*, 3 September 2003 incorporating change 1, 2 September 2005, V14-18.

⁴LtCol Christopher Plamp, interviewed by author, 2 March 2006. (Notes). LtCol Plamp served as a

battalion air liaison officer with Joint Special Operations Command during the early phases of Operation Enduring Freedom in 2001-02. Later, he returned to Afghanistan in 2005 flying combat missions in the A-10 as the operations officer of the 74th Fighter Squadron.

⁵James S. Corum and Wray R. Johnson, *Airpower in Small Wars: Fighting Insurgents and Terrorists* (Lawrence: University Press of Kansas, 2003), 7, 427-8, 430-1.

⁶JP 3-09.3, I-4.

⁷JP 3-09.3, I-7.

⁸JP 3-09.3, I-4.

⁹The F-16, F-15E, and A-10 commonly carry targeting pods and Litening pods. The following compares the FOV specifications between a targeting pod, a Litening pod, and the Predator's AN/AAS-52 sensor ball: targeting pod wide FOV = 6° x 6°, narrow FOV = 1.7° x 1.7°. Litening pod wide FOV = 18.4° x 24.1°, medium FOV = 3.5° x 3.5°, narrow FOV = 1° x 1°. Predator sensor ball: ultra wide FOV is 34° x 45°, medium FOV is 5.69° x 7.64°, ultra narrow FOV is 0.15° x 0.20°. "AN/AAQ-13 & AN/AAQ-14 LANTIRN Navigation & Targeting Pod," *F-16.net*, n.p., on-line, Internet, 9 March 2006, available from http://www.f-16.net/f-16_armament_article2.html. "RAFAEL Litening Targeting Pod," Defense Update: *International On-Line Defense Magazine*, 8 July 2002, n.p., on-line, Internet, 9 March 2006, <http://eschel.co.il/dui/> directory/ litening.htm. Operator's Manual MTS-TMSD-1.0, *Detecting Set, Infrared AN/AAS-52(V)1 and AN/AAS-52A(V)1*, (McKinney, TX: Raytheon, 2004), 19.

¹⁰ROVER allows ground troops with special laptop computers to receive real-time video imagery from the Predator. "Army Change, Air Force Change," *Air Force Magazine Online*, March 2006, n.p., on-line, Internet, 9 March 2006, <http://www.afa.org/magazine/March2006/0306army.asp>.

¹¹The Predator's communications capability will further increase in the near future with the inclusion of the KY-100 secure voice radio.

¹²Col Matt Neuenswander, USAF Element Director, CGSC, Ft Leavenworth, KS and Col Thomas Webster, Air Force Doctrine Center, Maxwell AFB, AL, interviewed by author, 14-15 March 2006. (email).

¹³A forward observer operates with front line troops and is trained to adjust ground or naval gunfire and pass back battlefield information. In the absence of a forward air controller, the observer may control close air support strikes. A TAC(A) is an officer who coordinates, from an aircraft, the actions of other aircraft engaged in air support of ground or sea forces. Note that neither one is authorized to conduct terminal attack control. JP 1-02 *Department of Defense Dictionary of Military and Associated Terms*, 12 April 2001 as amended through 31 August 2005, 216, 524.

¹⁴Adam J. Herbert, "Smashing the UAV Stovepipe," *Air Force Magazine Online*, February 2006, n.p., on-line, Internet, 9 March 2006, <http://www.afa.org/magazine/feb2006/0206UAV.asp>.

Combat Tenets Key to Success of UAS at JNTC

By

CPT Brendan E. Sullivan
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Effective airspace management and synchronized air and ground operations increase success on the battlefield. Unmanned Aircraft Systems (UAS) have contributed to higher density airspace, overlapping flight profiles, and operating envelopes intended to increase force effectiveness without hindering ground effort. The Joint National Training Center (JNTC) has integrated multi-echelon and joint UAS (P-3 Orion, Predator, Scan Eagle, Shadow, and Raven) into JNTC scenarios and by doing so is able to access Army Airspace and Command and Control (A2C2). A2C2 is facilitated in the Brigade Combat Team (BCT) and below by Air and Ground Integration Teams (AGIT), Brigade Aviation Elements (BAE), and Air Defense Airspace Management (ADAM) cells. The overall effectiveness of UAS is dependent on many factors to include decisions and procedures that foster the tenets of combat operations (Depth, Agility, Synchronization, Versatility, and Initiative) and by doing so better support the intelligence war-fighting function. Furthermore, UAS support the intelligence war-fighting function by increasing situational awareness, providing critical ISR collection, and providing actionable intelligence to support potential targeting. Ultimately, applying UAS that foster the combat operation tenets lead to highly effective UAS operations that increase support of the intelligence war-fighting function.



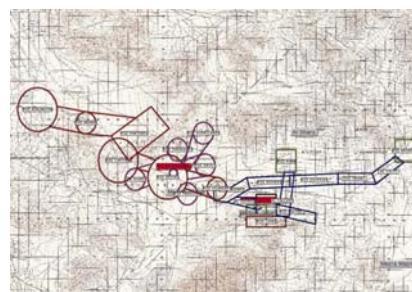
Agility. In the Shadow UAS real-time image, the BCT fosters agility by adapting to the changing enemy situation by detecting an IED emplacer. This image was fed into and displayed centrally into the BCT current operations cell.



Tenets of combat operations:

**Depth,
Agility,
Synchronization,
Versatility,
and Initiative**

Synchronization. BCT airspace is divided into 5 KM x 5 KM squares to foster synchronization, increase responsiveness, and maximize the use of airspace.



Versatility. Preplanned UAS procedural controls are implemented to allow for preplanned UAS missions.



Depth. In this JNTC screen-shot, the A2C2 plan allows for depth of joint and organic assets, flying 10 airframes over a BCT's area of operation



Initiative. High winds prevented the launch of a UAS. A decision was made to apply rotary winged assets to the named area of interests (NAI) in the BCT ISR plan.

UAS Support to Combat Search and Rescue (CSAR) Operations



The Predator waits...

Tallil Air Base, Iraq—A 64th Expeditionary Reconnaissance Squadron airman guides a Predator into its hangar following a mission. The Predators roam the skies of Iraq providing real-time information to commanders around the world. (USAF Photo by SSgt Robert Grande)

By
Lt Col Steve "Elroy" Colby, USAF
34 WPS/CC, Nellis AFB, NV

Combat search and rescue (CSAR) is a difficult mission that is complicated by the fact that we act at the pleasure of the enemy's action. We don't pick the fight's location, the isolating incident does: be it an aircraft shoot-down or a stranded patrol.

You're probably wondering what an unmanned aircraft systems (UAS) article has to do with CSAR. UAS are force multipliers for CSAR, period, and here's how. Historically an isolated personnel's (IP) probability of survival (Ps) diminishes over time, and quickly. Recovery within the first hour of isolation provides the greatest IP viability. At times over 5 hours, it can be shown that the IP's viability diminishes to roughly 20%. Either the enemy has had time to muster forces to find them or they succumb to injuries. With that in mind the reader can surmise that every effort to recover the IP must be accomplished in a way that minimizes delays. In the 10 years prior to Operation Iraqi Freedom (OIF)/Operation Enduring Freedom (OEF), history shows us that downed aircrew recovery times have been plagued by

surface-based command, control, communications, computers, and intelligence (C4I) decision delays which result in rescue launch delays amounting to an average of 3.95 hours. Initiatives to reduce these decision delays have been experimented with during Joint Expeditionary Force Experiment (JEFX) 2000, 2002, and 2004. As a result of these experiments, operational-level tactics, techniques, and procedures (TTP) have been developed to process IP as time sensitive targets. These aerospace operations center (AOC) processes work to speed recovery times by gathering essential supporting data in parallel while launching the rescue forces and holding them at a safe hold point en route if more data is needed or a support aircraft link-up is required. Speeding rescue into action while parallel processing of the order of battle, fine-tuning the IP's location, and coordinating with support assets like strikers, tankers, and suppression of enemy air defenses (SEAD) assets is essential to minimizing the recovery time thus maximizing Ps. So how does a UAS help with these tasks, you ask?

...operational-level tactics, techniques, and procedures have been developed to process IP as time sensitive targets.

UAS like the MQ-1 Predator provide AOC decision makers and rescue forces with unprecedented capabilities that improve recovery times by providing persistent situational battlespace awareness, remarkable sensor arrays, radio relay, real-time video feeds of the IP's pick-up area, laser designation for IP location, or buddy laze for weapons employment, and lastly Hellfire missiles for IP protection if necessary. This persistent coverage applies to many types of UAS but for this article we'll stick to the Predator.

The MQ-1's ability to loiter for long periods of time provides combatant commanders with persistent and sometimes overlapping surveillance coverage. Key hot spots are often covered by Predator cameras and that presence provides the most immediate means to start gathering situational awareness of the isolating incident. This must be understood by AOC personnel who can task the Predator to support the rescue based upon combined force commander (CFC) and combined force air component commander (CFACC) priorities. The MQ-1's relative cruise speeds (80 knots ground speed [KGS]) mean that moving the MQ-1 to a more distant IP location from its orbit can consume significant time. It is just as imperative to get the Predator moving in the right direction early as it is for the rescue forces to be launched at the earliest time.

This persistence in battlespace awareness provides coverage for IP communications that can fill voids in national asset collection windows. Testing has demonstrated that the MQ-1 can collect, forward, decrypt, and interrogate the IP using the Quickdraw system and the Hook-112 radio system through the Predator Ku- band satellite communication link. This clearly allows Predator crews to collect IP data very early and disseminate that data quickly to rescue forces, AOC, and data link architectures. IP location is the key to any rescue. Accurate and timely location and condition reporting, allows rescue forces to evaluate threats, terrain, and weather in preparation for the recovery. Without an accurate location, we're back to searching for the IP in a combat environment which is tactically unsound. Once the Predator locates the IP, the Predator crews can maneuver it to an orbit to survey the area for the IP. A critical part of recovery is authenticating the IP to ensure they are not under

The coordinates can be confirmed and refined and passed to the AOC and rescue forces through data links, mIRC, or voice transmission. The persistence, communications line-of-sight (LOS) relay, and location/identification (ID) capabilities make the MQ-1 an ideal low-orbit pseudo-satellite. These are duties customarily associated with initial on-scene-command (OSC). This author asserts that if the platform has the communications, fuel, and location/ID capability, it should be the initial OSC. The MQ-1 has the unique connectivity to allow parallel processing of the data via LOS radio communications from the aircraft to other support aircraft in the immediate vicinity allowing OSC hand-off as those support aircraft arrive. It has the ability to push data from the ground station to key decision makers in the combined aerospace operations center (CAOC) and joint search and rescue center (JSRC) through mIRC connectivity and other links.

The communication suite in the Predator allows communications on UHF, VHF-AM, and VHF-FM frequencies. While direct communication with personnel below the MQ-1 is accomplished via the UHF, VHF or FM radios, the video and communication link back to the Predator ground station is via Ku-band satellite link. The Predator can forward Quickdraw IP interrogations to arriving aircraft like the A-10 via Quickdraw data burst "candygrams" or "faxes" speeding into action those forces by minimizing coordinate transposition errors induced with voice communications. The combat survivor evader locator radio system (CSEL) contractor is currently designing a similar portable interrogator system for the CSEL radio (PRQ-7) that will allow similar interrogation and data burst capabilities. Neither system is currently fielded but it is presumed that this capability should and will be incorporated into the Predator ground control station (GCS) soon. An interesting by-product of these on-scene data-burst actions is that they can be monitored at the CAOC through national asset collection, building situational awareness (SA) at the operational level simultaneously to the tactical level.

...The MQ-1 has the unique connectivity to allow parallel processing of the data via LOS radio communications from the aircraft to other support aircraft.

This way, JSRC and CAOC support personnel can monitor the IP canned or free-text messages and direct/coordinate support actions accordingly. Lastly, the MQ-1 GCS has Voice-Over-Internet-Protocol SIPRNET secured telephone connectivity to the CAOC for direct voice coordination with operations-floor personnel.

The sensor array in the MQ-1 provides remarkably clear, magnified, digitally-scanned forward-looking infrared (FLIR) images that are available in eight different fields of view (magnification) and seven views in electro-optical (EO) low-light TV. In certain configurations, synthetic aperture radar is installed. These high-tech imaging packages provide MQ-1 crews and others with direct video-feed capability—the ability to see unprecedented visuals of the battlespace. As mentioned above, the FLIR can provide a means to authenticate the IP. The MQ-1 crew might direct the IP to pull up their left sleeve when they recite the first letter of the word of the day. When the MQ-1 crew starts to call out bogus letters with the correct letter amongst the bogus, they can watch the IP for correct action at the right time. When the IP is pinpointed, the MQ-1 crew can use that positional SA to then scan for adversary patrols or search teams and can even direct the survivor to hide when those teams get close. As rescue recovery aircraft approach, the Predator

can survey potentially suitable landing areas and inform rescue forces of the landing zone nearest the IP. ROVER-equipped recovery vehicles can receive this video stream directly, further building their recovery area SA.

The MQ-1 sensor packages include a laser designator that can provide buddy-lasing for precision-guided munitions (PGMs) dropped from support strikers like the A-10 or F-15E. These PGMs can disable enemy vehicles or personnel that present a threat to the IP. The modulation codes can be varied in flight from 1111 to 1888. MQ-1 crews are trained in CSAR operations to provide visual talk-on as well. The LASER can provide covert continuous or pulsed (fast or slow) position marking signals to provide visual marks for night vision goggle (NVG)-equipped support or rescue forces approaching the IP.

Lastly, the armed Predator can provide critical armed support if threats approach the IP. The AGM-114 Hellfire can be employed by MQ-1 crews to suppress, discourage, or kill approaching enemy forces in protection of the IP until heavily armed rescue forces arrive.

I hope this quick tutorial on the benefits of Predator support to CSAR ops gives joint readers a picture of the capabilities that UAS loiter-time, connectivity, sensor array, video-feed, and weapons employment contribute to IP recovery and time-sensitive-processing—contributions that speed into action rescue forces and increase IP viability in combat.



A Predator among us...

Tallil Air Base, Iraq—An RQ-1 Predator from the 46th Expeditionary Reconnaissance Squadron making a landing.(USAF Photo by SSgt Suzanne M. Jenkins)

Global Area Reference System (GARS)–

[Evolution of the Common Geographic Reference System (CGRS)]

By
LtCol John R. Anderson (USMC)
Maj Brady V. Merrill (USAF)
ALSA Center

Introduction

The Global Area Reference System (GARS) was approved by the Department of Defense (DOD) after being staffed through the Services/combatant commands. It is now the standardized battlespace area reference system which impacts not only Service doctrine, joint doctrine, and multi-Service tactics, techniques, and procedures (MTTP), but also the entire spectrum of battlespace deconfliction. This article walks the reader through the background and development of GARS, then provides a detailed description of GARS, and recommends the way ahead.

Background

Grid reference systems have historically been developed and used for battlespace deconfliction or as fire support coordination measures (FSCM). The predecessor to GARS was the Common Geographic Reference System (CGRS), which was developed for Operation Iraqi Freedom (OIF) and was hailed as one of the great success stories during OIF lessons-learned conferences. CGRS was a key enabler of the “digital” battlespace and the common operational picture. CGRS was the first area reference system introduced to the doctrine world in the multi-Service publication (FM 3-60.1, MCRP 3-16D, NTTP 3-60.1, AFTTP [I] 3-2.3), *Targeting of Time Sensitive Targets (TST)* published by the Air, Land, Sea Application Center (ALSA) in April 2004.

ALSA then initiated, planned, and hosted the milestone CGRS conference to both educate and build consensus within the Services/combatant commands, joint, and other government combat support agency communities on the use of a “standardized” battlespace area reference system. At the CGRS conference the disparate views of over 70 warfighters, doctrinaires, trainers, cartographers, system managers, software engineers, and requirements personnel were

addressed. Not only did this conference set CGRS as the base-line standard of area reference systems but, it also set the stage for the development of a worldwide system that would later become the Global Area Reference System (GARS).

Development

On 15 Dec 04, the Service Chiefs and the Chairman of the Joint Chiefs of Staff signed a letter agreeing to make CGRS (Appendix G of TST) the interim standard and recommended the National Geospatial-Intelligence Agency (NGA) develop a global standard. The Secretary of Defense (SECDEF) signed a letter on 25 Mar 05 tasking NGA to take the lead in developing it. From Mar-Aug 05, NGA hosted three joint working groups to solicit base-line requirements by which to develop a global standard initially known as the Common Area Designation System (CADS). It was later renamed GARS although the structure remained the same. In the fall of 2005, the NGA GARS proposal was staffed through the Services/ combatant commands via the Joint Staff. It was unanimously supported and subsequently approved in December of that year. In Jan 06, the Director of NGA sent a letter to the SECDEF stating NGA had completed its task of leading the DOD community in the development of GARS punctuated by the need for continued community engagement toward full implementation.

Why a Global Area Reference System?

Even with the latest change to the Unified Command Plan (UCP) that moved Syria and Lebanon from the USEUCOM AOR to the USCENTCOM AOR, there remains a significant potential challenge involving the borders between USEUCOM, USCENTCOM, and USPACOM. CGRS is a regional area reference system. Currently the combatant commands all have separate area reference systems. However, a conflict could erupt that crosses combatant commanders geographical areas of responsibility (AOR). This would lead to confusion by having multiple common geographic reference systems. The examples shown in the figure 1 include the following potentially volatile areas:

...Not only did this conference set CGRS as the base-line standard of area reference systems but, it also set the stage for the development of a worldwide system that would later become the Global Area Reference System (GARS).

- Israeli-Palestinian/Arab issues.
- Uncertainty of the ongoing tensions between India/Pakistan.
- Recent increase of US and international operations monitoring /supporting events in Sudan.
- Challenges of central Africa (USEUCOM AOR) as it borders Sudan and Kenya in USCENTCOM AOR.

Our enemies and potential flash points don't always conform to our UCP boundaries. What origin should we define for our global war on terrorism (GWOT) fight?

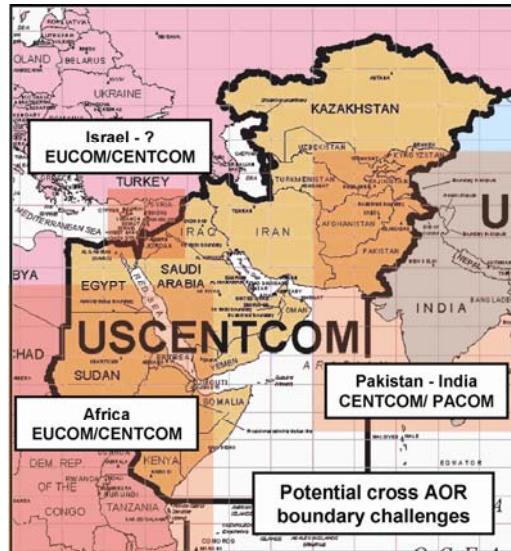


Figure 1. Multiple Area Reference Systems

Description of GARS

GARS is an administrative measure used to rapidly and clearly define global geographical locations for battlespace coordination, deconfliction, and synchronization versus a separate geographical grid system used for each AOR [CGRS]. It provides a common language between the Services/combatant commands and simplifies communications. GARS is highly useful in facilitating rapid attacks on TSTs and for expediting deconfliction of friendly force locations although it is not designed to support precise targeting. Rather than transmitting a series of latitudes and longitudes, an area can be defined by a brief yet succinct number/ letter character string.

Figure 2 depicts a 30'x30' cell with a CGRS and GARS label GARS consists of:

- An origin point (180E/W & 90S).
- Each cell (box) is 30'x30'.

—Each quadrant (15'x15') subdivision is depicted in its entirety on a single 1:50,000 chart.

—Easy to see keypad (5'x5') subdivisions because they already exist on 1:50,000 chart.

- A labeling system.

—It uses a standard "right & up" cell address convention which brings you to a 30'x30' cell.

—That current number-character naming convention is already in use at the operational level at both USCENTCOM and USPACOM and has been in use for some time (hence the ALSA model).

- Using 5'x5' as the smallest level of granularity makes it easy to use the 5'x5' keypad as a building block for larger area definitions.

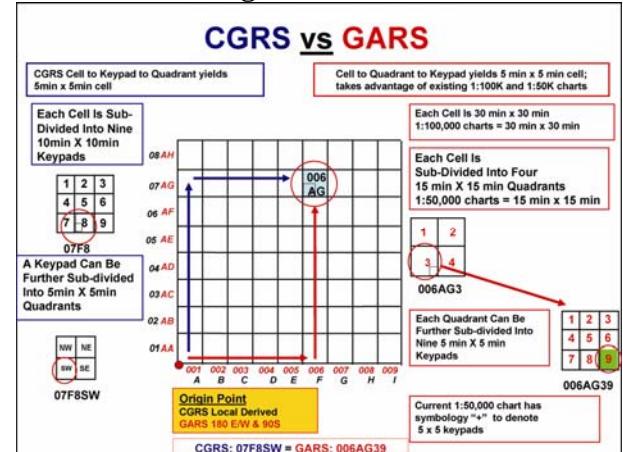


Figure 2. CGRS & GARS Comparison

The Way Ahead

The way-ahead focuses on GARS implementation. Joint Publication (JP) 2-03: *Joint Tactics, Techniques, and Procedures for Geospatial Information and Services Support to Joint Operations*, Mar 99, is currently being updated and will be the first Joint Publication to implement GARS into joint doctrine. The MTTP publications that will be affected are *TST*, *Kill Box*, *Joint Fires (JFIRE)*, and *Theater Air Ground Systems (TAGS)*. The first MTTP that will include GARS will be TAGS, which started its 3-year revision in Dec 05. The implementation of GARS will also affect JP 3-09, *Joint Doctrine for Fire Support*, and JP 3-60, *Joint Targeting*, which are currently under revision.

For further information please contact NGA's point of contact for GARS: Lt Col Peter C. Renner (NGA/OMSF) at COMM 703-264-7292/DSN 570-7292 or via email: Peter.C.Renner@nga.mil).

Conclusion

In conclusion, GARS is "THE" new area reference system approved by the SECDEF to be implemented by the Services as "THE" area reference system

for the globe. The countless benefits of standardizing a global area reference system are limited only by our imagination. GARS will be included in the re-write of several joint publications, MTTP, and Service doctrine during their normal revision cycles. GARS will facilitate significant multi-Service coordination at every level as we execute the Global War on Terrorism now and prosecute future conflicts.



Company A, 101st Military Intelligence Battalion, 3rd Brigade Combat Team, 1st Infantry Division, prepares a 200 UAS for launch at Forward Operating Base Warhorse, Iraq. (This photo appeared on www.army.mil.)

ALSA PROJECTS UPDATE CURRENT ALSA PUBLICATIONS			
TITLE	DATE	PUB #	DESCRIPTION
ADUS: MTTP for Air Defense of the United States Classified SECRET/RELCAN	22 MAR 04	FM 3-01.1 NTTP 3-26.1.1 AFTTP(I) 3-2.50	Supports planners, warfighters, and interagency personnel participating in air defense of the US by providing planning, coordination, and execution information. Pub is primarily focused at the tactical level. Includes Operation Noble Eagle and Clear Skies Exercise lessons learned. Current Status: Assessed Sep 05 (18mo). Revise Mar 07 (3yr). POC: Team E alsae@langley.af.mil
AVIATION URBAN OPERATIONS: Multi-Service Tactics, Techniques, and Procedures for Aviation Urban Operations Distribution Restricted	09 JUL 05	FM 3-06.1 (FM 1-130) MCRP 3-35.3A NTTP 3-01.04 AFTTP(I) 3-2.29	Provides MTTP for tactical-level planning and execution of fixed- and rotary-wing aviation urban operations. Current Status: Assess Jan 07 (18 mo). POC: Team E alsae@langley.af.mil
BREVITY: Multi-Service Brevity Codes Distribution Restricted	15 JUN 05	FM 1-02.1 (FM 3-54.10) MCRP 3-25B NTTP 6-02.1 AFTTP(I) 3-2.5	Defines multi-Service brevity codes to augment JP 1-02, DOD Dictionary of Military and Associated Terms. It standardizes air-to-air, air-to-surface, surface-to-air, and surface-to-surface brevity code words in multi-Service operations. Current Status: Assess Jan 07 (18 mo). POC: Team F alsaf@langley.af.mil
COMCAM: Multi-Service Tactics, Techniques, and Procedures for Joint Combat Camera Operations Approved for Public Release	15 MAR 03	FM 3-55.12 MCRP 3-33.7A NTTP 3-13.12 AFTTP(I) 3-2.41	Fills the void that exists regarding combat camera doctrine and assists JTF commanders in structuring and employing combat camera assets as an effective operational planning tool. Current Status: Under revision as of Mar 06. In Phase 1 (Program Research). POC: Team C alsac@langley.af.mil
EOD: Multi-Service Tactics, Techniques, and Procedures for Explosive Ordnance Disposal in a Joint Environment Approved for Public Release	27 OCT 05	FM 4-30.16 MCRP 3-17.2C NTTP 3-02.5 AFTTP(I) 3-2.32	Provides guidance and procedures for the employment of a joint explosive ordnance disposal (EOD) force. It assists commanders and planners in understanding the EOD capabilities of each Service. Current Status: Assess Apr 07 (18mo). POC: Team B alsab@langley.af.mil
HAVE QUICK: Multi-Service Tactics, Techniques, and Procedures for the Have Quick Radio System Distribution Restricted	MAY 04	FM 6-02.771 MCRP 3-40.3F NTTP 6-02.7 AFTTP(I) 3-2.49	Simplifies planning and coordination of HAVE QUICK radio procedures and responds to the lack of HAVE QUICK TTP throughout the Services. Additionally, it provides operators information on multi-Service HAVE QUICK communication systems while conducting home station training or preparing for interoperability training. Current Status: Assessed Nov 05 (18 mo). Revise May 07 (3yr). POC: Team C alsac@langley.af.mil
HF-ALE: Multi-Service Tactics, Techniques, and Procedures for the High Frequency-Automatic Link Establishment (HF-ALE) Radios Approved for Public Release	1 SEP 03	FM 6-02.74 MCRP 3-40.3E NTTP 6-02.6 AFTTP(I) 3-2.48	Standardizes high power and low power HF-ALE operations across the Services and enables joint forces to use HF radio as a supplement / alternative to overburdened SATCOM systems for over-the-horizon communications. Current Status: Assessed Mar 05 (18mo). Revise Sep 06 (3yr). POC: Team C alsac@langley.af.mil
IADS: Multi-Service Tactics, Techniques, and Procedures for an Integrated Air Defense System (IADS) Distribution Restricted	30 OCT 04	FM 3-01.15 MCRP 3-25E NTTP 3-01.8 AFTTP(I) 3-2.31	Provides joint planners with a consolidated reference on Service air defense systems, processes, and structures to include integration procedures. Current Status: Under assessment as of Apr 06. POC: Team D alsad@langley.af.mil

ALSA PROJECTS UPDATE CURRENT ALSA PUBLICATIONS			
TITLE	DATE	PUB #	DESCRIPTION
ICAC2: Multi-Service Procedures for Integrated Combat Airspace Command and Control Approved for Public Release	30 JUN 00 Retain until TAGS Revision	FM 3-52.1 (FM 100-103-1) MCRP 3-25D NTTP 3-52.1(Rev A) AFTTP(I) 3-2.16	Provides detailed TTP for airspace C2 to include specialized missions not covered in JP 3-52, <i>Doctrine for Joint Airspace Control in a Combat Zone</i> . It includes specific information on interfaces and communications required to support integrated airspace control in a multi-Service environment. Current Status: Currently being incorporated into TAGS revision. (See TAGS for more information.) POC: Team D alsad@langley.af.mil
IDM: Multi-Service Tactics, Techniques, and Procedures for the Improved Data Modem Integration Distribution Restricted	30 MAY 03	FM 6-02.76 MCRP 3-25G NTTP 6-02.3 AFTTP(I) 3-2.38	Provides digital connectivity to a variety of attack and reconnaissance aircraft. It facilitates exchange of near-real-time targeting data and improves tactical situational awareness by providing a concise picture of the multi-dimensional battlefield. Current Status: Under revision as of May 06. In Phase 1 (Program Research). POC: Team C alsac@langley.af.mil
IFF: MTTP for Mark XII IFF Mode 4 Security Issues in a Joint Integrated Air Defense System Classified SECRET	11 DEC 03	FM 3-01.61 MCWP 3-25.11 NTTP 6-02.4 AFTTP(I) 3-2.39	Educes the warfighter to security issues associated with using the Mark XII IFF Mode 4 Combat Identification System in a joint integrated air defense environment. It captures TTP used today by the warfighter that can address those security issues. Current Status: Assessed Jun 05 (18mo). Revise 1 Dec 06 (3yr). POC: Team A alsaa@langley.af.mil
JAOC / AAMDC: Multi-Service Tactics, Techniques, and Procedures for Joint Air Operations Center and Army Air and Missile Defense Command Coordination Distribution Restricted	22 MAR 04	FM 3-01.20 AFTTP(I) 3-2.30	Addresses coordination requirements between the Joint Air Operations Center and the Army Air and Missile Defense Command. It assists the JFC, JFACC, and their staffs in developing a coherent approach to planning and execution of AMD operations. Current Status: Assessed Sep 05 (18mo). Revise 1 Mar 07 (3yr). POC: Team D alsad@langley.af.mil
JATC: Multi-Service Procedures for Joint Air Traffic Control Distribution Restricted	17 JUL 03	FM 3-52.3 (FM 100-104) MCRP 3-25A NTTP 3-56.3 AFTTP(I) 3-2.23	Provides a ready reference source for guidance on ATC responsibilities, procedures, and employment in a joint environment. It discusses JATC employment and Service relationships for initial, transition, and sustained ATC operations across the spectrum of joint operations within the theater or area of responsibility (AOR). Current Status: Assessed Jan 05 (18mo). Revise 1 Jul 06 (3yr). POC: Team F alsaf@langley.af.mil
JFIRE: Multi-Service Procedures for the Joint Application of Firepower(JFIRE) Distribution Restricted	30 OCT 04	FM 3-09.32 MCRP 3-16.6A NTTP 3-09.2 AFTTP(I) 3-2.6	Used as a pocket size guide of procedures for calls for fire, CAS, and naval gunfire. It provides tactics for joint operations between attack helicopters and fixed-wing aircraft performing integrated battlefield operations. Current Status: Assessed 1 Mar 06 (18mo). Early Revision Sep 06 (2yr). POC: Team A alsaa@langley.af..mil
JSEAD / ARM-J: Multi Service Tactics, Techniques, and Procedures for the Suppression of Enemy Air Defenses in a Joint Environment Classified SECRET	28 MAY 04	FM 3-01.4 MCRP 3-22.2A NTTP 3-01.42 AFTTP(I) 3-2.28	Fills a planning and employment void not captured in existing Joint Tactics Techniques and Procedures. It contributes to Service interoperability by providing the JTF and subordinate commanders, their staffs, and SEAD operators a single consolidated reference. Current Status: Assessed Nov 05 (18mo). Revise May 07 (3yr). POC: Team A alsaa@langley.af.mil
JSTARS: Multi-Service Tactics, Techniques, and Procedures for the Joint Surveillance Target Attack Radar System Distribution Restricted	17 MAR 03	FM 3-55.6 (FM 90-37) MCRP 2-1E NTTP 3-55.13 (Rev A) AFTTP(I) 3-2.2	Provides procedures for the employment of the Joint Surveillance Target Attack Radar System (JSTARS) in dedicated support to the JFC. Current Status: Under revision as of Nov 05. In Phase 3 (Program Development). POC: Team D alsad@langley.af.mil

ALSA PROJECTS UPDATE CURRENT ALSA PUBLICATIONS			
TITLE	DATE	PUB #	DESCRIPTION
JTF IM: Multi-Service Tactics, Techniques, and Procedures for Joint Task Force Information Management Distribution Restricted	10 SEP 03	FM 6-02.85 (FM 101-4) MCRP 3-40.2A NTTP 3-13.1.16 AFTTP(I) 3-2.22	Describes how to manage, control, and protect information in a JTF headquarters conducting continuous operations. Current Status: Assessed Mar 05 (18mo). Revise Sep 06 (3yr). POC: Team C alsac@langley.af.mil
JTF LNO Integration: Multi-Service Tactics, Techniques, And Procedures For Joint Task Force (JTF) Liaison Officer Integration Distribution Restricted	27 JAN 03	FM 5-01.12 (FM 90-41) MCRP 5-1.B NTTP 5-02 AFTTP(I) 3-2.21	Defines liaison functions and responsibilities associated with operating a JTF. Current Status: Assessed Jul 04. Retain. POC: Team G alsaq@langley.af.mil
JTMD: Multi-Service Procedures for Joint Theater Missile Target Development Distribution Restricted	11 NOV 03	FM 3-01.51 (FM 90-43) NTTP 3-01.13 AFTTP(I) 3-2.24	Documents TTP for threat missile target development in early entry and mature theater operations. It provides a common understanding of the threat missile target set and information on the component elements involved in target development and attack operations. Current Status: Assessed May 05 (18mo). Transition to JP 3-01; <i>Countering Air and Missile Threats</i> and other ALSA MTTPs. POC: Team D alsad@langley.af.mil
KILL BOX: Multi-Service Tactics, Techniques, and Procedures for Kill Box Employment Distribution Restricted	15 JUN 05	FM 3-09.34 MCRP 3-25H NTTP 3-09.2.1 AFTTP(I) 3-2.59	Assists the Services and joint force commanders in developing, establishing, and executing Kill Box procedures to allow rapid target engagement. It describes timely, effective multi-Service solutions to FSCMs, ACMs, and maneuver control measures with respect to Kill Box operations. Current Status: Assess 1 Jan 07 (18mo). POC: Team B alsab@langley.af.mil
NLW: Tactical Employment of Non-lethal Weapons Approved for Public Release	15 JAN 03	FM 3-22.40 (FM 90-40) MCWP 3-15.8 NTTP 3-07.3.2 AFTTP(I) 3-2.45 USCG Pub 3-07.31	Supplements established doctrine and TTP providing reference material to assist commanders and staffs in planning/coordinating tactical operations. It incorporates the latest lessons learned from real world and training operations and examples of TTP from various sources. Current Status: Under revision as of Jan 06. In Phase 3 (Program Development). POC: Team F alsaf@langley.af.mil
PEACE OPS: Multi-Service Tactics, Techniques, and Procedures for Conducting Peace Operations Approved for Public Release	26 OCT 03	FM 3-07.31 MCWP 3-33.8 AFTTP(I) 3-2.40	Provides tactical level guidance to the warfighter for conducting peace operations. Current Status: Assessed Apr 05 (18mo). Revise Oct 06 (3yr). POC: Team E alsae@langley.af.mil
REPROGRAMMING: Multi-Service Tactics, Techniques, and Procedures for the Reprogramming of Electronic Warfare and Target Sensing Systems Distribution Restricted	6 JAN 03	FM 3-51.1 (FM 34-72) MCRP 3-40.5B NTTP 3-13.1.15 AFTTP(I) 3-2.7	Supports the JTF staff in the planning, coordinating, and executing of reprogramming of electronic warfare and target sensing systems as part of joint force command and control warfare operations. Current Status: Under Revision as of Jan 06. In Phase 3 (Program Development). POC: Team G alsaq@langley.af.mil
RISK MANAGEMENT Approved for Public Release	15 FEB 01	FM 3-100.12 (FM 5-19.1) MCRP 5-12.1C NTTP 5-03.5 AFTTP(I) 3-2.34	Provides a consolidated multi-Service reference, addressing risk management background, principles, and application procedures. It identifies and explains the risk management process and its differences and similarities as it is applied by each Service. Current Status: Assessed Aug 05 (18mo). Reassess Feb 07 (3yr). POC: Team G alsaq@langley.af.mil
SURVIVAL, EVASION, AND RECOVERY: Multi-Service Procedures for Survival, Evasion, and Recovery Distribution Restricted	19 MAR 03	FM 3-50.3 (FM 21-76-1) MCRP 3-02H NTTP 3-50.3 AFTTP(I) 3-2.26	Provides a weather-proof, pocket-sized, quick reference guide of basic survival information to assist Service members in a survival situation regardless of geographic location. Current Status: Under Revision as of Mar 06. In Phase I (Program Research). POC: Team B alsab@langley.af.mil

ALSA PROJECTS UPDATE CURRENT ALSA PUBLICATIONS			
TITLE	DATE	PUB #	DESCRIPTION
TACTICAL CONVOY OPERATIONS: <i>Multi-Service Tactics, Techniques, and Procedures for Tactical Convoy Operations</i> Distribution Restricted	MAR 05	FM 4-01.45 MCRP 4-11.3H NTTP 4-01.3 AFTTP(I) 3-2.58	Consolidates the Services' best TTP used in convoy operations into a single multi-Service TTP. It focuses on combat support and combat service support forces and provides a quick reference guide for convoy commanders and subordinates on how to plan, train, and conduct tactical convoy operations in the contemporary operating environment. Current Status: Currently under assessment as of Mar 06 (12mo). This publication is on a 2 yr-revision cycle. POC: Team E alsae@langley.af.mil
TACTICAL RADIOS: <i>Multi-Service Communications Procedures for Tactical Radios in a Joint Environment</i> Approved for Public Release	14 JUN 02	FM 6-02.72 (FM 11-1) MCRP 3-40.3A NTTP 6-02.2 AFTTP(I) 3-2.18	Standardizes joint operational procedures for Single-Channel Ground and Airborne Radio Systems (SINCGARS) and provides an overview of the multi-Service applications of Enhanced Position Location Reporting System (EPLRS). Current Status: Assess Dec 06 (18mo). POC: Team G alsag@langley.af.mil
TAGS: <i>Multi-Service Tactics, Techniques, and Procedures for the Theater Air Ground System</i> Approved for Public Release	8 DEC 03	FM 3-52.2 (FM 100-103-2) MCRP 3-25F NTTP 3-56.2 AFTTP(I) 3-2.17	Promotes inter-Service awareness regarding the role of airpower in support of the JFC's campaign plan, increases understanding of the air-ground system, and provides planning considerations for the conduct of air-ground operations. Current Status: Under Revision as of Dec 05. In Phase 3 (Program Development). POC: Team D alsad@langley.af.mil
TST: <i>Multi-Service Tactics, Techniques, and Procedures for Targeting Time-Sensitive Targets</i> Distribution Restricted	20 APR 04	FM 3-60.1 MCRP 3-16D NTTP 3-60.1 AFTTP(I) 3-2.3	Provides the JFC, the JFC's operational staff, and components unclassified MTTP to coordinate, de-conflict, synchronize, and prosecute TST within any AOR. It includes OIF and OEF lessons learned, multinational, and other government agency considerations. Current Status: Assessed Oct 05 (18mo). Revise Apr 07 (3yr). POC: Team F alsaf@langley.af.mil
UHF TACSAT/ DAMA OPERATIONS: <i>Multi-Service Tactics, Techniques, and Procedures package for UHF TACSAT Frequency Management</i> Approved for Public Release	JUN 04	FM 6-02.90 MCRP 3-40.3G NTTP 6-02.9 AFTTP(I) 3-2.53	Documents TTP that will improve efficiency at the planner and user levels. (Recent operations at JTF level have demonstrated difficulties in managing limited number of UHF TACSAT frequencies.) Current Status: Assessed Dec 05 (18mo). Revise Jun 07 (3yr). POC: Team C alsac@langley.af.mil
UXO: <i>MTTP for Unexploded Explosive Ordnance Operations</i> Approved for Public Release	16 AUG 05	FM 3-100.38 MCRP 3-17.2B NTTP 3-02.4.1 AFTTP(I) 3-2.12	Describes hazards of unexploded explosive ordnance (UXO) sub-munitions to land operations, addresses UXO planning considerations, and describes the architecture for reporting and tracking UXO during combat and post conflict. Current Status: Assess 1 Feb 07 (18mo). POC: Team B alsab@langley.af.mil

NEW ALSA PROJECTS
(Please contact the POCs for more information.)

TITLE	DATE	PUB #	DESCRIPTION
AIRFIELD OPENING: Multi-Service Tactics, Techniques, and Procedures on Airfield Opening	DEC 06	TBD	<p>Serves as a single source reference guide for use by planners and commanders while preparing for and executing airfield opening operations. It will apply to those forces involved in the establishment of an airfield following either a permissive or non-permissive turnover.</p> <p>Current Status: Under Development as of Dec 05. In Phase 3 (Program Development).</p> <p>POC: Team E alsae@langley.af.mil</p>
CITO: Multi-Service Tactics, Techniques, and Procedures for Cultural Impact on Tactical Operations	OCT 06	TBD	<p>Provides Service members with an understanding of the complexities of foreign cultures and will also assist military commanders in their training strategies.</p> <p>Current Status: Under Development as of Nov 05. In Phase 3 (Program Development).</p> <p>POC: Team E alsae@langley.af.mil</p>
CIVIL SUPPORT: Multi-Service Tactics, Techniques, and Procedures for Civil Support	OCT 06	TBD	<p>Provides guidance and procedures for activities and measures taken by the military Services when domestic disaster/emergency exceeds management capabilities of local, state, or federal agencies.</p> <p>Current Status: Under Development as of Dec 05. In Phase 3 (Program Development).</p> <p>POC: Team C alsac@langley.af.mil</p>
CORDON AND SEARCH: Multi-Service Tactics, Techniques, and Procedures for Cordon and Search Operations	MAR 06	FM 3-06.20 MCRP 3-31.4B NTTP 3-05.8 AFTTP(I) 3-2.62	<p>Consolidates the Services' best TTP used in cordon and search operations into a single multi-Service TTP. It focuses on tactical level units and provides a quick reference guide for planning, training and execution of cordon and search operations.</p> <p>Current Status: Under Development as of Feb 05. In Phase 5 (Command Approval).</p> <p>POC: Team F alsaf@langley.af.mil</p>
DETAINEE OPERATIONS: MTTP for Detainee Operations in the Global War on Terrorism Distribution Restricted	MAR 06	FM 3-63.1 MCRP 4-11.8D NTTP 3-07.8 AFTTP(I) 3-2.51	<p>Provides TTP to be employed in planning for and executing the protection, handling, holding, transfer, transport, interrogation, and release of GWOT detainees.</p> <p>Current Status: Delayed awaiting approval of DOD Directive 2310.1E, <i>The Department of Defense Detainee Program</i>.</p> <p>POC: Team B alsab@langley.af.mil</p>
TECHINT: Multi-Service Tactics, Techniques, and Procedures for Technical Intelligence	MAY 06	TBD	<p>Serves as a reference for service TECHINT planners and operators to build and execute coordinated multi-Service operations. It provides guidance on evacuation of captured material and provides joint force staffs with guidance concerning the TECHINT mission, requirements, and capabilities.</p> <p>Current Status: Under Development as of Jun 05. In Phase 5 (Command Approval).</p> <p>POC: Team G alsag@langley.af.mil</p>
MILDEC: Multi-Service Tactics, Techniques, and Procedures for Military Deception	NOV 07	TBD	<p>Facilitates the integration, synchronization, planning, and execution of MILDEC operations. It will serve as a single reference for Service MILDEC planners to plan and execute multi-Service MILDEC operations.</p> <p>Current: Under Development as of Dec 05. In Phase 3 (Program Development).</p> <p>POC: Team G alsag@langley.af.mil</p>
UAS: Multi-Service Tactics, Techniques, and Procedures for the Tactical Employment of Unmanned Aircraft Systems	JUL 06	TBD	<p>Establish tactics, techniques, and procedures that address tactical and operational considerations, system capabilities, payloads, mission planning, logistics, and multi-Service employment.</p> <p>Current Status: Under Development as of Jul 05. In Phase 4 (World-Wide Review).</p> <p>POC: Team A alsaa@langley.af.mil</p>

ALSA Web Page

By TSgt Jorge Venegas
NCOIC, Air Land Sea Application Center

A one stop source for information and resources...

ALSA unveiled its new Web site in August 2005. It was a multi-year project and was developed by VP1 Technologies. The new design and features include individual team pages, a calendar, JASC only section, automatic email notification, and the ability to restrict access to areas of the site.

The advantage of this new site is the ability of action officers to manage content directly from their desktop computer. This provides more up to date and timely posting of information. The ALSA Web site is located at <http://www.alsa.mil> and can be accessed from any .mil or .gov computer. The most common problem we have experienced with those who are having access issues is that their computer is not DNS compliant and therefore does not get recognized as a .mil or .gov computer. Below are two quick ways to check for DNS compliant name:

Option 1:

Step 1: In Win2000, right click on My Computer. Click on Properties and then on the “**Network Identification**” tab. In WinXP, right click on My Computer, click on Properties and select the “**Computer Name**” tab.

Step 2: Check “**Full computer name**” and “**Domain:**” to ensure it ends in a .mil or .gov address; if it does not, notify your IT personnel of the problem.

Option 2:

Step 1: Open web browser and go to <http://ebirds.afis.mil>.

Step 2: Click on “**Access help?**” to the right of the calendar.

Step 3: Scroll down to “**Here is a DNS Test Service that you can use...**” Click on the test link.

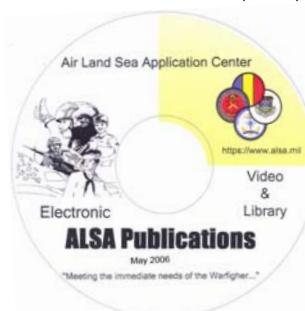
Step 4: You will get a screen that shows your Host Name and IP Address “DNS Translates To:”

Step 5: Send that information to your network personnel.

ALSA will continue to support the warfighter and looks forward to any and all comments or suggestions to our Web site.

ALSA CD-ROM

The ALSA CD-ROM is an easily transportable electronic library, including: all multi-Service tactics, techniques, and procedures maintained at ALSA; the history of ALSA; and the ALSA video. Order CDs by e-mailing alsaadmin2@langley.af.mil or calling DSN 575-0902, Comm: (757) 225-0902.



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